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UTCS ComputerNews

To find out what these places have in common
see the User Profile on page 4:
TBANK: From East to West in Five Minutes

Other Features

A new director at UTCS. See the article entitled "Looking Forward" on page 3.

Would you like to save yourself a phone call or a trip to the Advising Office? *COMPUTERNEWS* has started a new column this month called "The Advising Corner". See page 29 for details.

ISSN 0315-4661 **January/February 1983** **No. 204**

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Cover

Special thanks to Patricia Shore for the art work on the cover of this issue and the December issue of *COMPUTERNEWS*.

Publisher

University of Toronto
Computing Services
Toronto, Ontario
Canada M5S 1A1

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Publication Date: January 14, 1983.

Subscriptions

Subscription changes should be entered on the tear-out form at the back of this issue, and mailed to the Information Office, Engineering Annex, Room 206 (or phone 416-978-4990).

COMPUTERNEWS is published 8 times yearly by University of Toronto Computing Services. Enquiries or contributions should be directed to:

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Toronto, Ontario
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Dialogue

There are a wide range of feelings as I review the contents of this issue of *COMPUTERNEWS.* First and foremost is a sense of anticipation, a sense that our new Director will set a new course for improvements. Hopefully the pair of articles, "Looking Back" and "Looking Forward", convey a bit of this feeling. Generally I smile and ignore the traditional "New Years Resolution" syndrome that saturates the media this time of year. Yet this particular January does seem to be more than an arbitrary marker in the flow of time.

There is a disturbing side to this anticipation though. It's not at all clear that the rest of the University wants to change. For example, only one letter to the editor was received this month. I certainly appreciate the support expressed in this letter and it reflects the positive tone of comments I have received by phone. Yet the critical feedback isn't coming. This clearly does not imply that all users are happy with the status quo. But it may indicate that investing time and energy in planning for development is a low priority.

It may also indicate that users are overwhelmed by the complexity of computing. One of the most difficult aspects of editing *COMPUTERNEWS* is to present technical copy in a way that a user can understand the full implications of a technical change. This is becoming more difficult, as systems become more user friendly. The report on BICS in this issue is a case in point. Some of the most interesting facts which would help to explain how this system is evolving are simply not available because of the internal complexity of the system. Nevertheless, BICS affects the instructional environment for an ever increasing number of students. BICS is still an evolving system, and feedback is needed from both instructors and students to guide its development.

A refreshing aspect of the article on "TBANK" in this issue is the fact that complexity can be handled with appropriate planning. Successfully utilizing a program on the UTCS system from Eastern Europe required considerable planning and testing. A relatively simple level of planning and foresight can also pay large dividends for the user who never leaves the U of T campus. With this is mind, the series on data security continues in this issue with an article on "IBM Disk Backups and Restores".

I invite you then to read this issue of *COMPUTERNEWS* with a critical eye. With your feedback, perhaps Dialogue in the next issue will be, in fact, part of a dialogue.

Bill Fehlner

Looking Back

Dr. Doron Cohen was Director of UTCS from early in 1978 until December, 1982. These five years have seen many changes in computing at the University of Toronto, both inside and outside of UTCS. Some of these changes have been driven by economics, others by the rapidly expanding need for computing facilities in both teaching and research. In the following paragraphs, we look back over this period from the perspective of the departing Director.

When Dr. Cohen arrived in 1978, there were in effect several, physically distinct centres for computing making up UTCC, as it was then called. Each of these centres had its own operations staff and systems staff. Dr. Cohen made it his first priority to

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Looking Back continued

consolidate the hardware into a single machine room and to reduce duplication in operations and systems. To quote from the September, 1978 issue of *COMPUTER-NEWS,* his goal was to provide "a quality computing service at lowest possible cost, while maintaining a high degree of responsiveness". Consolidation was his first initiative towards meeting this ambitious goal. The latest phase of the consolidation was completed this past summer with the transfer of the special forms printers from the Engineering Annex to the McLennan Labs machine room.

There have been many changes in equipment over these past five years. The inability of a given machine configuration to meet ever increasing demands for computing power was one reason for these changes. Another incentive for change is economics. Because the market for computing hardware is so volatile, there are large financial rewards for knowing the market and timing equipment changes carefully. Twice during the past five years, a large IBM mainframe has been sold by UTCS at a profit. In both cases, the market value of the equipment dropped by 50% within a few months of the sale. The capital savings realized from these well timed sales were used to finance essential improvements in service.

Student services have undergone a dramatic evolution over the past five years. In 1978, undergraduate computing depended almost exclusively on card access to the High Speed Job Stream. An initiative taken shortly after Dr. Cohen's arrival resulted in the micro-based VIVA workstations. These provided the student with a fullscreen editor, user friendly menus, and full on-screen browsing of outputs. Dr. Cohen still feels that the VIVA project was farsighted - in his words "that's where we'll end up when economics catches up with technology". Despite a successful pilot installation of VIVA, there weren't sufficient economies of scale in 1980 to expand the project into a general student service. Instead, the development of larger scale student access via screens moved to the VAX based LIBRA system. This is one of several times that UTCS staff have been mobilized to create a viable system in a short time frame. Work on LIBRA began in March of 1981. A prototype of LIBRA was being used for student instruction within six months and the Robarts Library site, designed specifically for LIBRA, opened three months later.

The LIBRA achievement was eclipsed in the summer of 1982 by the seven week installation of the latest student services initiative, BICS. With the IBM - University of Toronto Partnership Agreement, hardware became available to rapidly extend student services, but it required a complete changeover from the software used in the LIBRA system. The operating system, student interface, text editor, and machine to machine communications were all different and had to be integrated into a working system. Dr. Cohen recalls being told by industry professionals that this project would take a minimum of seven months for the software installation alone. He is proud that UTCS met the challenge and students were learning to use BICS in mid-September.

Despite economies for the central UTCS facility, made possible through consolidation, there is a definite trend towards providing facilities dedicated to groups of users with a common need. The Computing Disciplines Facility in the Engineering Annex and the research VAX at Erindale College are two examples. In each case, UTCS staff operate and maintain the facility, while the users set policy and direction. This trend was recognized in the recent UTCS redeployment by establishing a Facilities Management Group. Dr. Cohen foresees a larger role for this type of facilities management as the falling prices of hardware make user owned standalone systems more attractive.

Unfortunately, the achievements of the past five years have been overshadowed by a gradual reduction in UTCS responsiveness due to general university cutbacks. In addi-

continued...

Looking Back continued

tion, some of the special projects mentioned above have required a temporary reallocation of staff from the service areas. Even innovations such as the introduction of Computing Services Representatives have not been able to reverse this trend. Nonetheless, as Dr. Cohen leaves UTCS, he is proud to leave behind a team who, "given any mission, can make it happen".

Bill Fehlner

Looking Forward

On January 1, 1983, Dr. Warren C. Jackson joined UTCS as our new Director. He came to us from his previous position as Manager, Consulting Services for the Information Systems Department of the Molson's Companies Ltd. Dr. Jackson earned a PhD in physics from the University of California and was a post-doctoral research fellow at U of T from 1970 through 1973. Since that time, he has developed a career in the computing field, working with several companies before accepting the management position with Molson's.

Late in December, I had the opportunity to meet Dr. Jackson and learn about his background and aspirations first hand. His open manner and smile quickly put me at ease — letting me know that he was willing to share a bit of himself. He relaxed even more when I explained that I hoped to introduce him to the readers of *COMPUTERNEWS* as a person, not as a distant figurehead. As we talked, it became clear that although he valued his experience in the business world, he felt a need to learn more about the unique environment of the University. The excitement that Dr. Jackson radiated as we talked was very contagious.

The Consulting Services Group that he managed at Molson's supplied a certain level of technical expertise to the subsidiary companies that they could not afford to maintain inhouse. For example, needs analysis, security analysis, and the installation of small systems were provided by this Consulting Services Group. This group was also responsible for negotiating and managing corporation-wide contracts with vendors and service bureaus. These functions have some intriguing analogies with the type of role the central computing facility can play at a university.

Dr. Jackson definitely sees a role for a central computing facility at the University of Toronto. It does not and cannot meet all needs but there are many things which it does best. It provides a range of 'soft' services which facilitate the use of computing resources without requiring that the user become an expert. These include upfront services such as education and consulting which help users come onboard. A central facility provides a set of resources and software difficult to supply on a small machine. Even as small machines become more powerful, centralized support for common packages remains at a higher level with much less duplication of effort.

A reasonable model for UTCS could be the service bureau which reduces costs to the University in the classic sense. UTCS provides raw cycles and the user pays only for what is used. UTCS is able to absorb dramatic peak loads without complicated scheduling by the user. Central support for packages and the availability of consulting are also consistent with a service bureau model. The model is even more appropriate if UTCS is seen as a collection of smaller service bureaus, each with a very specialized role, sharing certain resources.

Measuring the effectiveness of UTCS is where the service bureau analogy breaks down. The usual financial measures are not applicable. Even cost effectiveness is diffi-

continued...

Looking Forward continued

cult to measure in an environment where users generally demand a much higher level of service at a much lower direct cost than is provided by commercial service bureaus. Dr. Jackson sees UTCS as a complex organization imbedded in an even more complex environment. Different sets of measures are applied to UTCS by different groups and these measures are sometimes diametrically opposed. He chose to focus on measuring user satisfaction in our discussion.

There are two key questions that Dr. Jackson will be asking in evaluating user satisfaction. How responsive is the organization to helping users to access the services they need, and then, are these services of sufficient quality, breath and efficiency to meet users' needs? Generally people are satisfied if they are easily able to get their hands on the computing they need. If this is to happen, UTCS must be able to offer facilitating services and appropriate machine resources in a financial framework which makes these accessible.

Dr. Jackson indicated that in a business context it isn't always necessary to use all the cycles on a machine every day. However, in the University environment, machine cycles are treated as a resource and are considered wasted if not consumed. Thus a financial environment must be created to allow UTCS to offer these resources at all times while recovering the cost of providing them. However, to avoid impeding people who are trying to develop new, unique applications, Dr. Jackson sees a need for some form of seed money, regardless of how UTCS is funded, to allow a "test drive on the system", so that innovation is not stifled.

In our conversation, Dr. Jackson came across as an open person who enjoys interacting with people. He is dynamic and finds the challenge of directing a complex organization exciting. This enthusiasm was reflected both in the way he generated ideas as we talked and in the fact that he was willing to share these ideas. His questions probed beneath surface appearances to try and understand how and why things happen in the university environment.

Dr. Jackson feels that serious issues are best handled face to face. He intends to be fairly accessible so that he can get firsthand information, particularly on issues of global interest. On the other hand, he will encourage the use of normal channels for day to day business. When possible, he likes to keep his relationships informal to reduce barriers to communication.

On behalf of the UTCS staff and users of UTCS services I would like to welcome Dr. Jackson to UTCS and trust that he will find his appointment a challenging and rewarding experience.

Bill Fehlner

TBANK: From East to West in Five Minutes

Dr. C. B. Alcock, a Professor in the Department of Metallurgy and Material Science, has developed a databank for accessing information on the thermodynamic properties of substances. Dr. Alcock's particular field of interest is high temperature chemistry and his databank, called TBANK, is a result of a need for accessible data in his work. High temperature chemistry is used in research on high speed aircraft, nuclear power, and ceramics, and deals with temperatures ranging from 500 to 3000 degrees Celsius. With these extreme temperatures, it is necessary to have accurate information, and TBANK is able to provide it much more conveniently than the traditional handbooks and published data. The databank, whose programs are written in SHARP APL, is accessed on the Academic IBM 3033 computer here at the University

continued...

TBANK continued

of Toronto. Originally, TBANK was used by Dr. Alcock in his research at the University of Toronto. Recently, he has experimented with accessing this facility from other cities in North America and, last September, from Poland.

When I spoke with Dr. Alcock in December, I found his work with remote access to the databank particularly interesting. His experience illustrates that there is a right way and a wrong way to attempt international access to databanks.

- Dr. Alcock, how did you go about testing the accessibility of TBANK?

  "I started to experiment on accessing the U of T computer from abroad about two years ago. I began by using TELENET and DATAPAC, and I was able to get access to the databank from Washington at the National Bureau of Standards. I gave a demonstration of the databank in Washington, live, calling up Toronto. Then I got a friend who is a professor of Chemistry of the University of Kansas to try from Kansas City so that it was a bit further away. Then I went across to Vienna [Austria] and ran the databank from the Department of Chemistry in the University of Vienna. After that I went and ran the databank from Poland last September."

- Why did you decide to try to access TBANK from Poland?

  "I belong to an international organization called CODATA which had a meeting in Poland, and CODATA is interested in databanking, evaluation, transmission and dissemination of data by computer. The Poles undertook to make it possible for us to access Western databanks. They did that, even though the meeting was held in the country about forty miles outside Warsaw. We were in a country house, and had a field telephone connected to a radio transmitter, which connected to the land lines in Warsaw, and hence to Vienna. From Vienna the transmission went by satellite to America, then up to DATAPAC, and via DATAPAC to Toronto and our computer. I sat in Poland working the computer, doing calculations and having them printed up. Even with enormous distances and a number of different transmission systems on the way, it is possible to access the computer from any part of the world now. TELENET enables us to get around the Western world, but we now have the possiblility of connecting with the East as well.

- How long did it actually take to connect to UTCS?

  "We were through very quickly. The field telephone got on to the radio transmitter in less than a minute, and we got through to the university in less than five minutes. Mind you, I had done a lot of homework. I went to the University of Vienna just before going to Poland, and spent four days there checking the system from Vienna. In a sense, all the ground work had been laid, and all the Poles had to do was call Vienna. Once we were there, making the connections to U of T was easy."

- Once you have access to the databank, how do you use it?

  "I have stored the coefficients of polynomials in temperature and from these I can calculate the thermodynamic properties of individual substances. There are also programs to group data for different substances together so that reactions between substances can be calculated. For example, the data for hydrogen, the data for oxygen, and the data for water can be brought together to calculate the extent to which hydrogen and oxygen will react to form water at a given temperature."

- What are the sources of the information in TBANK?

  "The source of information for the data-

continued...

TBANK continued

bank is published data, and the published data in this particular field of high temperature chemistry was brought to an almost completely modern state in the early '70s.... From these sources one could get very good information (up to the '70s) but, of course, science goes on and new data arrives. It must be possible to put new data into the bank, and to carry out critical evaluations. Say five groups of people make the same measurement, and get different answers. You look at them and try to decide if one is a good one or if they all come together and give a good average number. The programming of the databank enables me to enter new data from the literature, and either to leave it in the simple form as it was published or to do some critical evaluation with it and then derive numbers which can go into the databank after evaluation."

- I understand that the programing for TBANK is written in SHARP APL. Why did you use APL?

"It's a nice mathematical language and you can think things out in it much more easily. You don't have to read and copy and list [as] you do in FORTRAN.... If I had written it in FORTRAN it would have been portable, but if I had written it in FORTRAN I wouldn't have got as far as I have. Writing programs in FORTRAN is rather a long and tedious business even now, with built in debugging, whereas APL is quick and sharp (to coin a phrase) and you can do it all with expedition."

- Are you considering any extensions to the databank?

"Well, we have now a databank with the capability for manipulating the data to describe chemical reactions as well as programs which enable us to evaluate data in literature. This is just thermodynamics. The high temperature chemist wants other chemical properties such as viscosity, conductivity and so forth, and so the next phase will be to enter those data as well and have parallel banks. [The handbook] which is the source of information for chemists and physicists now will become computerized. In this computerized version, instead of having tables of numbers where you have to interpolate if you want to get between them, in fact we can have functions which can do those calculations for us at any temperature. It becomes a sort of active reference book in the sense that you can easily generate new numbers from it.

"[Also] a collegue in electrical engineering and I are getting together now to see if we can have a process control microcomputer, that is to say, something that will make measurements on the system (laboratory system or industrial system), and use those measurements to start some calculations on the databank. The results of those calculations on the databank will then be fed back to the system for process control. Thus we have a looped control in the middle of which sits the databank."

- What are your future plans for TBANK?

"It's no use having a perfectly good databank here if nobody else can use it apart from me, so I've been very concerned about accessibility of the databank from other places. This is largely brought about because I've worked for the International Union of Pure and Applied Chemistry (IUAPC). There is a need for a databank which could be accessible to either specific groups, national groups of evaluators, or to the individual scientist.

"What I would like to do is give copies of my programs to other computer centres but unfortunately it is [written in] SHARP APL and [only three universities in North America] have SHARP APL. That's one of the grave shortcomings of the whole business, depending on SHARP who are not used any where else but here. I'm not about to rewrite the

continued...

TBANK continued

whole thing in FORTRAN. I've gone too far down the road.

"What I'm looking at now as an alternative possibility is that if one could squeeze the bank onto a micro rather than on a mainframe, then it may be possible that parts of the bank could be stored on the micro. Someone in the iron and steel industry could take off just the bit that interested them in the iron and steel industry, and someone making glass could take out the bit of the bank that interested them. If we couldn't compress the whole thing into a micro, then part of it could be put into a micro. I'm rather keen now to look into the possibility of going from the university's mainframe onto a micro."

- Are you going to be doing more demonstrations of TBANK in the next few months?

"No. I think the proper way to go now would be to get the thing mounted on micros and get some firm to market them. I'd rather leave this to a company whose job it is to sell a product. I'm just biding my time till we can find a decent SHARP APL microcomputer group. I'm talking with a company now who might just be able to do it."

- Do your future plans include other projects like TBANK?

"No, I think this is enough to keep me going for the rest of my Professional life... If we could persuade SHARP to make available a compiler in five or six different countries, we could then have international linkage. I have misgivings about keeping U of T as the only place, but I don't know how to get the corresponding thing working in Washington or Moscow or Paris or Tokyo. That's another problem to solve. I'm working on it."

Patricia L. Shore

Education Facility Co-ordinator

978-4565 - Memorize this telephone number!

If you are interested in attending a Short Course, if you want to rent a terminal or some other computer equipment, or if you are using the Education Facility, you will have to get in touch with the Education Facility Co-odinator and this one telephone number is the key to all you need to know.

Irene Rosiecki, the Education Facility Co-ordinator, has a very busy work week. As the Short Course Co-ordinator she must plan, schedule, organize and follow-up all of the Short Courses which UTCS offers. (There are now thirteen courses.) When a person phones enquiring about a Short course, she puts their name on a waiting list. As soon as ten or twelve people have indicated they are interested in a course, Irene schedules a convenient time in consultation with the instructor. Then, when the course is scheduled, she telephones all those on her waiting list to see if they can attend the course. Sometimes, the majority of the people cannot attend and then the course is cancelled. Ususally though, courses proceed as scheduled. Irene says, "I can understand users who get frustrated who want to schedule around courses, but we can't really schedule the days [of the courses] if we haven't got enough people."

With thirteen different courses to handle, just answering and returning calls can take up a large part of her time. She does her best to answer questions about the courses, and often she will refer you to the course instructor if you need more information.

continued...

Co-ordinator continued

Irene's short course responsibilities don't end with the telephone inquiries. It is also her job to organize the classroom where the course will be held, to put together the course handouts, and to handle course evaluations. In addition, she tries to make sure that there are enough chairs, that the terminals are working, and that the instructor has all the supplies she or he needs. All this goes on 'behind the scenes'. Most users only see Irene when they stop by her office at McLennan Labs, Room 217, to pay their ten dollar course registration fee.

When Irene isn't co-ordinating Short Courses, she is renting out terminals and printers. (You can telephone her for the complete list of what is available.) While only six hours a week is allotted in her schedule for renting out terminals, Irene finds it usually takes much longer. When someone calls to arrange a rental, she has to bring the piece of equipment, a terminal or printer, from the stock room to her office and set it up for a demonstration. If all goes well, the actual demonstration can take about half an hour. In accord with Murphy's Law, however, Irene has had to contend with reluctant terminals, busy lines, and a multitude of other problems. In her spare time she has been testing the rental equipment in the stock room to insure that all equipment is in good running order.

In addition to Short Courses and terminal rentals, Irene also maintains the Education Facility. This facility is located in McLennan Labs, Room 221 and has two parts. The inner room (the Education Facility) is a classroom where the Short Courses are held. This room is open from 9 a.m. to 5 p.m. daily and is available to researchers and graduate students when no course is in progress. There are 10 ASCII terminals, an IBM 3279 colour graphics terminal, and a DECwriter available for use. The outer room is the Research Facility and it contains terminals exclusively for use by researchers and graduate students. There are four Lanpar XT-100s, three Cybernex terminals, two GIGI graphics terminals, and a VIVA Workstation which is available for demonstrations. The Research Facility also has a Diablo terminal and a graphics printer for the GIGI terminals. The room is open from 9 a.m. until building closing (presently at 10 p.m.), Monday to Thursday, and from 9 a.m. to 5 p.m. on Friday. The Education Facility is closed on weekends.

The primary purpose of the Education Facility Co-ordinator is to help users. If you are interested in Short Courses, terminal rentals, or the Education Facility, give Irene a call at 978-4565.

Patricia L. Shore

Colour Graphics on the IBM 3279

UTCS is now offering interactive graphics facilities to its users. In the Education Facility, Room 221, McLennan Labs, there is an IBM 3279 colour graphics terminal, and in the Research Facility (located in the outer area of Room 221) there are two GIGI graphics terminals. These three terminals are available for the exclusive use of reseachers and graduate students. The IBM 3279 is not available when Short Courses are being held in the Education Facility. Features of the IBM 3279 are described in this article. The use of GIGI terminals as graphics output devices on TSO is explained in the article which follows.

The IBM 3279-3B is an interactive colour graphics terminal in the IBM 3270 line. Among its options are extended highlighting, basic colour, extended colour, APL/text, and programmed symbols.

The extended highlighting option allows for underscore, blinking, and reverse video. It

continued...

Graphics: IBM 3279 continued

can be used to draw attention to parts of the screen. The highlighting can be controlled by a software application or, if the application program permits it, by the terminal user.

The basic colour option allows fields on the screen to be red, blue, green, or white. The colours used are chosen by the 3279 and not by the application program. Its selection is based on the type of field. Hence, normal protected fields come out blue while unprotected fields come out green. Fields normally intensified on a 3278 come out blue (protected) and red (unprotected).

Thus if you sign-on to WYLBUR using a 3279 its messages will be blue and what you type in will be in green. TSO is even more colourful, using all four colours. Note that neither TSO or WYLBUR are 'deciding' the colours — the 3279 does that without their knowledge.

Using the extended colour option, fields or individual characters can be displayed in any of seven different colours: red, blue, green, white, yellow, turquoise, and pink. At any given time the 3279 is either in basic colour mode or in extended colour mode. Unlike basic colour mode, the extended mode requires that the application know about and select the colour to be output on the screen. SAS/GRAPH is one of the few programs that can do this.

The 3279 has characters which are presented on the screen as 9 points horizontally by 12 points vertically. The terminal is capable of generating standard typewriter characters (letters, numbers, special characters) in the so called base character set. In addition, the IBM 3279-3B has the APL/Text option and this comes with additional characters normally used in the APL programming language. Also, the 3279-3B is capable of being loaded with six sets of customized characters, each set capable of 190 symbols. These symbols could be technical symbols, foreign language letters, or sets of graphic elements which could be used to build graphs, bar charts, and other graphic representations of data.

Programmed symbols are loaded under program control, and can be altered whenever required. Of the six programmed character sets, three are triple-plane sets. This means the character is defined in three planes, one for each of the primary colours of red, blue, and green. Using triple-planes any of the seven colours can be used in combination within a single character position. This could be useful in a graphics application, for example, if we have a point where three differently coloured lines intersect; using triple-planes the character describing that point would correctly show all three lines as separate colours.

SAS/GRAPH is the only facility which currently supports this terminal at UTCS. The terminal is identified within SAS/GRAPH by coding DEVICE=IBM3279 as a GOPTION. When putting up a graph SAS first loads the programmed symbols buffers. While this is happening transient patterns appear on the display screen. Then SAS will put up the desired graph by using the characters it has programmed into it.

Further information on the IBM 3279 can be obtained by contacting Central Advising at 978-HELP.

Alex Nishri

Graphics on GIGI Terminals

At present, it is possible to use the two GIGI terminals located in the Education Facility as graphics output devices on two systems - TSO on the IBM, and the DEC-10. This article explains the steps required to display graphics output from SAS/GRAPH under TSO. In particular, setting up the GIGI, configuring the TSO session, and running a sample SAS program are described in detail. Although much of this information can be found by a diligent search of vendor documentation, presenting it here is intended to make GIGI terminals easily accessible.

Before it can be used as a graphics terminal, a GIGI must be 'set up' appropriately to make it compatible with the system to be used. When both the monitor and terminal are turned on the GIGI is set up by pressing the "SET-UP" key located in the upper left-hand corner of the keyboard. (Please note that when the terminal is turned off, all the settings revert to their default values.) GIGI will scroll the display down and show the SET-UP window. SET-UP parameters are represented by two-character mnemonic codes such as 'TS' for 'Transmit Speed'. These may be cycled through by pressing either the left or the right arrows to go backwards and forwards respectively. To see what options are available for any particular parameter, press the space bar to cycle through those. Note that leaving an option displayed in the SET-UP window is equivalent to setting the parameter for that option. To examine a specific parameter without cycling through the whole lot, you can just specify its mnemonic code. Once you have made all the settings, press the SET-UP key to leave the SET-UP mode.

For instance, if you were going to use SAS/GRAPH from TSO, you would set up the GIGI as follows:

PARAMETER	MNEMONIC	SETTING
Duplex	LE	on
Local/Remote	LL	on-line
Parity	PE	even
Roll/Page	SM	smooth
Transmit Speed	TS	4800
Receive Speed	RS	4800
Terminal Mode	TM	ANSI
Transmission Synch.	XO	off
Graphics Prefix	GP	on

To begin, press RETURN repeatedly until PACX asks for the class. For TSO you would reply with 32. Since you will require the caret (^) translate table for doing graphics, reply "t^" when prompted with the line "enter t for tso, w for wylbur, ...", and then proceed to logon, preferably with a region of 1000K. To do this, enter;

```
LOGON TS01234 SI(1000) <cr>.
```

After your logon is completed, the next step is to enter the following two commands:

```
alloc da(*) fi(ft97f001) bl(255)  <cr>
terminal linesize(255) nolines  <cr>
```

The alloc command instructs SAS/GRAPH to route all colour graphics output to the terminal and the terminal command adjusts the linesize appropriately.

If you now wanted to plot a 3-D function on your screen, your first step would be to create a dataset (or a member of a partitioned dataset) containing the appropriate SAS/GRAPH program. As an example, suppose that the following SAS/GRAPH program was contained in TS01234.DRAGON.PLOT.

```
GOPTIONS  HSIZE=17  VSIZE=10;
DATA;
  DO  X=-5 TO 5 BY .25 ;
```

continued...

Interactive Graphics continued

```
  DO  Y=-5 TO 5 BY .25 ;
  Z=COS(SQRT(X*X+2*Y*X+Y*Y));
  OUTPUT; END; END;
PROC  G3D ;
  PLOT  Y*X=Z;
  TITLE  .H=10  GIGI DEMONSTRATION ;
```

You would now allocate the dataset by typing

```
alloc da(dragon.plot) fi(demo) shr   <cr>
```

All that is left to be done is to invoke SAS, specifying that the output device will be the GIGI, and telling it the name of the file which contains the program. This is done by typing

```
runsas device(gigi)   <cr>
```

SAS will respond first with some introductory messages and then with a number followed by a question mark, i.e. 1?. In response to this prompt type

```
%include demo ; run ;   <cr>
```

Within a few seconds, you will see a message from SAS telling you that WORK.DATA1 was created and you will hear a beep from the terminal. Press RETURN and you will see the plot being drawn on the screen in front of you. If, instead of the plot you expected, you see numbers in square brackets appearing, you have not turned on the graphics prefix. Exit SAS by pressing BREAK and typing END. Change the SET-UP, and start again from the step which invokes 'runsas.'

A word of caution: Plotting using SAS/GRAPH from TSO tends to get quite expensive!

In the near future, a new version of KIG (Kernel Interactive Graphics) will be released. This version will permit plots to be drawn on the screen and will support GIGI as one of the of the valid output devices. Notices will be posted in *COMPUTERNEWS* and in Broadcast messages when the new version is made available for user testing.

The new version of KIG will not only affect graphics on TSO but also graphics on the DEC-10. Users will be able to write a FORTRAN program on any terminal (graphics or not) and then run it on a GIGI and watch the plotting.

It is also possible to do some graphics on the DEC-10 from BASIC by using REGIS (Remote Graphics Instruction Set) commands in your BASIC programs.

If you require any additional information or help in using the GIGI, please call either Central Advising at 978-HELP or Kin Fong at 978-4924.

Happy Plotting!

Krys Warchol

UTCS User's Committee

These notes reflect the discussions of a meeting some weeks ago. In the interim actions have changed some of the details and a new meeting of the User's Commitee will have taken place before you read these brief comments. Please contact your departmental representative or myself for fuller details.

At the December meeting of the User's Committee the matter of special forms charging which had been the subject of motions at a previous meeting was again discussed. The resolutions passed in this forum had suggested that the passing on of these charges in mid-year by UTCS to the users was undesirable. Vice-president Nowlan responded to the Committee that

continued...

User's Committee continued

he did not intend that users should be disadvantaged during mid-year. Arrangements were proposed whereby funds would be made available where necessary. The latest version of the proposal is contained in a memorandum mailed by Vice-President Nowlan to Principals, Deans and Directors and dated December 23, 1982.

An announcement was made in this forum regarding the future Director of UTCS, Dr. Warren C. Jackson, as well as the future role of Mr. Allan Heyworth, currently Associate Director of UTCS, who will be assuming a role in University Network planning.

A number of announcements were made regarding UTCS' future real money charges for the Gould, Calcomp, punched cards, Xerox 9700, as well as details of the Christmas shutdown. Some announcements were also made regarding the changes in the services available at public terminal sites with Series/1 emulation of IBM 3278 terminals.

All DATAPAC usage charges incurred by UTCS will be used as the basis of monthly invoices sent to the users. These invoices will reflect the actual costs including an allowance to cover UTCS' fixed costs, as well as an invoice surcharge to cover UTCS' costs in preparing and handling the invoicing.

A suggestion was made to provide a telephone answering machine in the machine room to report any problems during unattended machine operation. (Such a service was installed in late December.)

Professor Swenson reported on the possible acquisition by the University of PLOT-10, a graphics plotting package. There have been some discussions with various interested parties regarding the choice of a suitable plotting language. The vendor of PLOT-10, Tektronix, has indicated willingness to consider a single license fee for the entire campus. The result is a loosely formed Special Interest Group for Graphics, which has been convened by Professor Swenson.

Dr. Frank Spitzer

User Special Interest Groups

There are a number of special interest groups on campus where computer users with similar interests meet to discuss matters of common concern. One of the oldest such groups is the Humanities Interest Group (HIG) under the Chairmanship of Professor John Hurd. For a number of years, this group has provided a useful forum for researchers on campus who have traditionally worked in a non-computer oriented environment. Presentations have been made by members of the University Academic Community, and also by at least one invited guest, on various aspects of computing in the humanities environment. Recently, numerous meetings have been held by this group to consider a proposal emanating from a committee chaired by Professor Allistair McKinnon of McGill University to form a National Computing Facility, funded by the Social Sciences and Humanities Research Council (SSHRC). As a result there has been some dialogue between various members of the U of T community and Professor McKinnon. The proposal being discussed includes the possibility of specialized summer schools. The discussions are far from resolved.

An APL users group under the Chairmanship of Professor Len Fertuck has provided a valuable source of feedback to UTCS concerning the provision of APL services. The group meets from time to time as required by the perspective of either the users or UTCS and discusses problems and propo-

continued...

Interest Groups continued

sals for changes in service.

An emerging group which is still having its birth pangs deals with graphics. It has evolved from a need to acquire improved graphics facilities on campus, and has support from a diverse group of academic and research users on campus. At the present time the contact person is Professor Eva Swenson. As the group gains stability a chairman will be appointed. The current focus of the group is the possible acquisition of preferred graphics software package for campus wide use.

In addition to these groups, special user forums have been hosted by UTCS and other groups on a regular basis. Examples have included the DEC-10 User Forum, the Physics Users Commitee, the Computer Aided Instruction Committee, and the Steering Committees at Erindale and Scarborough campuses.

If any other group of people feel that their common interests will be best served by a smaller and well focussed special interest group, I would be delighted to hear from them.

Dr. Frank Spitzer

DATAPAC Charges

Effective February 1, 1983 users requiring access to UTCS facilities via DATAPAC will require a special access code for this purpose. Please call Accounting Services at 978-3960 for information and the necessary application forms.

In order for UTCS to adjust DATAPAC facilities in response to load, recovery and allocation of costs is necessary. The charges will consist of two components:

- an invoice handling fee of $10 per month (billed only when actual use of DATAPAC occurs)
- a connect time charge of $12 per hour, to cover Bell Canada charges, plus planning and development costs.

Marg Doherty
Dr. Frank Spitzer

Online Editing: Full Value for Your Dollar

In the coming months the UTCS Marketing Group will be taking a more active role in promoting UTCS products and services. Our primary objective is to show users how to get full value for their computing dollar.

One might think that the best way to accomplish this would be to write efficient programs, use well tested packages, move data to tape and release unused online storage. While all these are important considerations, there is another facet (particularly in these times of budgetary restraint) that should not be ignored -- programmer productivity. To translate this catch-all phrase into real terms means the programmer must have fast and easy access to the computer. He should be able to create and submit programs for processing, to retrieve the results, to print only the ones required, and to manage his data effectively.

In the batch IBM environment, the single, most effective step to take in this direction is to change from the keypunch/card system to an interactive one like WYLBUR.

The preparation and editing of programs on

continued...

Online Editing continued

a keypunch has always been a frustrating and tedious task. In most instances the programmer is forced to go to the keypunch since it is usually close to the card reader and printer. The working environment leaves much to be desired -- it is generally messy, noisy, and over-crowded. You pay for the punched cards, pay to read them in, and then pay for the output, whether it is correct or not. While it is true that you pay for connect time with WYLBUR, you do not pay to 'read in' your program and you certainly do not have to pay printing costs for programs which fail.

Public access to interactive terminals is available at several sites on campus. Therefore, the only reason you would need to go to a keypunch/reader/printer area would be to retrieve the output you specifically wanted printed. Access to the computer via WYLBUR and computer packet switching networks is not limited to the campus. With a terminal and acoustic modem the UTCS system can be reached from almost anywhere in the world (see the article on "TBANK" in this issue).

There are other benefits to using a system like WYLBUR -- it becomes much easier to get assistance from UTCS when the programmer runs into difficulties. Since programs are stored on the computer, the programmer need only call UTCS at 978-HELP. An advisor can immediately look at the problem from his terminal and suggest corrective action. For both UTCS and the programmer, this is certainly much more effective and productive than trudging over to the advisor with a handful of output that is destined for the recycle bins shortly after the programming problem has been resolved.

As mentioned at the beginning of this article, the Marketing Group is planning an active 'campaign' to point out the cost and productivity benefits of WYLBUR. Watch *COMPUTERNEWS,* HOTNEWS and other media for announcements and details.

Ihor Prociuk

Table Formatting with tbl

A one day course on UNIX 'tbl' is offered by UTCS. This brief course introduces users to the UNIX program 'tbl'. The program will convert a simple description of a table into a troff program which will print the table.

'tbl' allows you to specify a variety of column layouts including left or right justified, centered, or numerically aligned columns. An example of a table with these features follows.

'tbl' files are processed using either simulated or real phototypesetting. As phototypesetting is paid for in unsubsidized funds (i.e. real money), it is necessary to arrange that access to typesetting be made available on your UNIX account prior to the course. This can be done by phoning the UTCS Accounting Office at 978-8703.

It is recommended that those taking this course have a good working knowledge of UNIX text processing in order to benefit from this course.

To register for this course please contact the Education Facility Co-ordinator at 978-4565. There will be a $10 registration fee to cover course notes and course preparation. Registration in this course is limited to six persons. However, a waiting list will be maintained so that future courses can be scheduled.

Dawne Smith

Standing in Courses

Percentage	Grade	Value	Grade Definition
90-100	A+	4.3	
85-89	A	4.0	Excellent
80-84	A-	3.7	
77-79	B+	3.3	
73-76	B	3.0	Good
70-72	B-	2.7	
67-69	C+	2.3	
63-66	C	2.0	Adequate
60-62	C-	1.7	
57-59	D+	1.3	
53-56	D	1.0	Marginal
50-52	D-	0.7	
Credit/No Credit:	CR*	No Value	
35-49	E	0.3	Inadequate
0-34	F	0.0	Wholly inadequate
Credit/No Credit:	NCR	0.0	

An example of a simple table, formatted using the 'tbl' program on the Unix System.

USERBOOK Updates

USERBOOK is the official reference manual for all UTCS computing services, and is now being updated on a regular basis.

Due to a change in UTCS policy on the automatic updating service for USERBOOK, existing subscribers will not be mailed updated sections. In its place an automatic notification will be mailed every 3 months to all Customer Account Number (CAN) and System Access Code (SAC) holders. This notification will be free of charge. *COMPUTERNEWS* as well as HOTNEWS will also be used to inform users about our updates.

Copies of all USERBOOK sections are available for reference at the Information Office and all remote terminal sites.

Only Sections 1 and 2 of USERBOOK (currently under revision) will be available free of charge. All other sections can be purchased through the Information Office, Engineering Annex, Room 206. Computer allocated funds cannot be used to purchase USERBOOK, and if not paid by cash or cheque, real money accounts must be used.

Recent updates include: 3.3 Debug which describes techniques useful in debugging programs; 3.3 Diskdm which describes the preparation, allocation and management of online disk datasets on the IBM processor; 3.3 Tapes which explains and describes the use of magnetic tapes on the IBM processor; 3.3 Wylbur which provides a basic introduction to the Wylbur system of online interactive text editing capabilities, and facilities for remote job entry, and 3.4 Subutils which describes the UTCS-supplied utility subroutines. Note that a prerequisite for

continued...

USERBOOK continued

all of the above modules is USERBOOK Section 3.0.

The following is a list of current USERBOOK sections which are either under revision or out of stock. Sections which are out of stock will be checked for accurate information before re-stocking.

Under Revision

1.0 General Introduction to UTCS
2.0 Rates
3.4 Utilities
3.4 Utils
3.5 Language Processors
3.5 Linkedit
3.5 Mark IV
4.0 Interactive Services (APL)

Out of Stock

3.3 Batch
3.3 TSO
3.3 TSOedit
3.7 Optim

Users are encouraged to forward their comments on our documentation to the Information Officer, Engineering Annex, Room 206, or to phone 978-4990. The Information Office is open from 9 a.m. to 1 p.m. and 2 p.m. to 5 p.m., Monday through Friday.

Vera Cabanus

BMDP - 1982 Release

A number of new features have been added to the BMDP system for 1982, along with major enhancements to several programs and routine problem maintenance throughout the package. Although BMDP82 is not yet available at UTCS, some of the new features to note are:

- A powerful convenience feature has been implemented which causes the program to generate repetitions of a basic form specified by the user. For example, you can now instruct the program to either repeat the same transformation over a range of variables or repeat an entire problem over a range of case subsets.
- Another feature allows users to include selected sections of BMDP instructions from an external file and substitute specified parameter values for symbols in the included instructions. This 'macro' capability can be used, for instance, to build a library of commonly used complex transformations. When a particular transformation is desired, the user points to the 'macro' defining the transformation and supplies the variable name or names to which the transformation is to be applied.
- The BMDP programs now scan all common instructions for syntax and consistency problems. Previously, execution was terminated after a single problem was found. In addition, many of the programs will ensure that all program-specific instructions are scanned before terminating due to an error condition.

One program, BMDP1T, is available for the first time in BMDP 1982. BMDP1T is used for univariate and bivariate spectral analysis, a technique that is frequently used by statisticians for examining data that appears to have cycles. BMDP1T is documented in the 1981 BMDP Manual and the 1982 "BMDP User's Digest".

However, some changes have been made to the design of this program since these books were published. You can obtain information about the changes by including

```
/PRINT NEWS.
```

the first time you run BMDP1T.

continued...

BMDP continued

Several new features have been added to BMDP4V, which was released for the first time in 1981. These features should make design specification and output interpretation easier.

- In the BETWEEN paragraph, specification of CODES or CUTPOINTS for each factor is no longer required.
- In the WITHIN paragraph, category information for the within factors was formerly required. This was unnecessarily confusing, since most within designs are completely crossed and the category values did not appear with the data. To specify the number of levels of the within factors in a completely crossed design, the LEVELS statement can be used.
- In the case of repeated measures designs with a single dependent variate, the program guessed the name of the dependent variate by using the name of the input variable associated with the first measure. This was fine as long as the user was aware that the program did this. In most cases, however, the output showed a label for the dependent variate, such as TEMP1, which made it appear as though only the first measure was being analyzed. In the new version of the program, the name of the dependent variate in a univariate repeated measures design is specified by using the DEPVAR statement in the WITHIN paragraph.
- If a briefer presentation of all the tests for a single dependent variable is desired, you can get a summary table in a classical ANOVA format by stating UNISUM in the ANALYSIS paragraph.

Detailed information about the new features can be found in the May 1982 issue of the "BMDP Communications," or in the revised and updated edtion of the "BMDP User's Digest." The Digest is a condensed version of the BMDP 1981 Manual and gives you:

1. a brief definition and example of each instruction for every program;
2. symbols that clearly mark required instruction, preassigned values, and key options;
3. references to appropriate pages in the 1981 Manual for those who desire further information;
4. how to create, read and copy BMDP files;
5. system instructions for IBM and other hardware.

Copies of the Digest are available from the Information Office for $7.25.

BMDP82 will be available in the near future. If you have any questions about the new features, or program corrections, please call the Advising Office at 978-HELP. Please watch HOTNEWS for details on testing and production dates.

Diane Mitchell

SAS PROC RECODE

Researchers using computers to analyze data frequently need to replace the values of some or all variables with new values. In the past, a typical approach to this operation was to use multiple IF-THEN statements. This approach is often time-consuming and inefficient, as well as being inadequate for some types of value changes. UTCS has had a RECODE Procedure available within SAS for several years which can help to alleviate these problems, but many people, especially new SAS users, do not know about it.

PROC RECODE has been designed as a comprehensive and efficient solution to the problem of value substitution. RECODE features a simple SAS-like syntax and in-

continued...

SAS PROC continued

corporates typical SAS parameters and options such as DATA, OUT, and FUZZ. RECODE is able to handle a wide variety of recoding situations, such as collapsing a range of values into a single value, converting numeric values to character values and vice versa, checking for high and low values of a variable, and performing limited character-string manipulation.

The function of RECODE is to create a SAS data set containing the specified value substitutions. No printed output is generated. Two basic types of statements are used with RECODE: the PROC RECODE statement, which is used to initiate the entire RECODE procedure, and RECODE statements, which are used to direct the procedure. Any number of RECODE statements may be used in a single procedure. They are performed in the order given and are independent of each other. The only restriction is that only one variable type (character or numeric) may be changed in a single RECODE statement.

Complete documentation for PROC RECODE is available online, and a copy can be printed by using the following JCL:

```
// EXEC SASRECOD
```

If thesis paper is desired, use:

```
// EXEC SASRECOD,FORMS=2018
```

The information in this article came from the PROC RECODE documentation. The procedure was developed by Douglas and Ione Cockrell, and is supported by the Computer Services Division of the University of South Carolina. If you have any questions or problems with PROC RECODE, please contact the Advising Office at 978-HELP.

Diane Mitchell

SPSS Introductory Guide

Early in 1982, SPSS Inc. and McGraw-Hill published a new manual entitled ‘‘SPSS Introductory Guide: Basic Statistics and Operations’’. The book is intended for novice users of the SPSS System, and focuses on the simple, most commonly used features and procedures, such as frequency distributions and bar charts, descriptive statistics, cross tabulations, analysis of variance and regression. Although the manual will not replace a basic statistics text, it may be a useful supplement in courses that combine the teaching of statistics and computing.

Each chapter features a statistical problem which is usually humorous as well as very illustrative of the appropriate analysis. For example, the title of Chapter 5 is ‘Selling Canary Crunch to Junior: Testing Hypotheses About Differences in Means’. The example discussed deals with an experiment comparing the effects of three types of commercials on boys and girls of various ages and races. The CROSSTABS and TTEST procedures are used to test various hypotheses, and the SPSS control cards and output are discussed.

The data bank which is used in the examples in several chapters is currently available in a dataset called APPL.STAT.SPSS.R90.HBANK. Copies of the ‘‘SPSS Introductory Guide’’ can be purchased from the Information Office for $14.30.

Diane Mitchell

APL T-Tasks, N-Tasks and B-Tasks

In July of 1981, N-tasks became available to UTCS APL Users. On November 29, 1982 the workspace, 1 BTASKREQ was installed in the APL Public Libraries, making B-tasks available. Thus there are now three types of APL tasks available to UTCS APL Users, and both time and money can be saved by choosing the correct type of task for an application. The following discussion is intended to summarize the characteristics of these tasks, and to point out some of the advantages of the N- and B-tasks.

In Sharp APL, a task is any actively computing session. There are three types of APL tasks: the T-task, the N-task and the B-task.

The Terminal Task:
The terminal, or T-task is the most common type of task, and is used interactively. A T-task is initiated when a user sits down at a terminal and signs on to APL.

The Non-terminal Task:
The non-terminal, or N-task is initiated by another task and executed immediately, independent of its parent task. It is initiated using the Sharp APL system function, ⎕RUN, which is described in the "SHARP APL Reference Manual," by Paul Berry. For example, a user may sit down at a terminal, sign on to APL, thereby starting a T-task, and from that T-task use the function ⎕RUN to start an N-task. Once started, that N-task is independent of the parent T-task and of the interactive terminal on which that T-task is running.

The Batch Task:
The Batch, or B-task is similar to the N-task, but does not execute immediately. A B-task request is submitted usually with specifications as to when the task should be executed. A B-task is submitted using functions in the public library workspace: 1 BTASKREQ. This workspace also contains functions with which you may inquire about the current state of your B-task requests.

Thus the most important difference between T-tasks and N-and B-tasks is that a T-task must have a terminal associated with it, while an N- or B-task is executed independently of the interactive terminal. N-tasks and B-tasks are particularly useful for applications which do not need to be interactive, such as applications in which all output and input is to and from files. For these applications N- and B-tasks have several advantages over T-tasks:

1. The task is less likely to be accidently interrupted. The risk of premature halt of execution due to terminal static or disconnect is eliminated.
2. There is no need to tie up an interactive terminal for the duration of the task.
3. They are less expensive to run since there is no connect charge.

The most important difference between N-tasks and B-tasks is the method of scheduling. N-tasks are scheduled by the parent task, while B-tasks are scheduled by the system B-task scheduler. B-tasks have the following advantages over N-tasks:

1. If a B-task is terminated abnormally due to a system crash, it is possible that it may be restarted automatically by the B-task scheduler when the system is started up again. The B-task scheduler will only attempt to restart such a task if the processing specification, ABNORMRST, was specified in the request. It is the programmer's responsibility to ensure that the task is capable of successfully surviving such a restart. Details for this are contained in the "SHARP APL Reference Manual" by Paul Berry and in "SHARP APL Technical Notes", issues 4 and 5.

continued...

APL continued

In addition, a task may be terminated before it is finished due to the system shutting down while that task is still active. When the system is started up again the B-task scheduler will attempt to restart such a task if ABNORMRST or NORMRST was specified as a processing specification. Again, it is the programmer's responsibility to ensure that the task is restartable.

2. It is possible to submit a B-task request well in advance of the time at which you wish it to run. This is useful for taking advantage of non-prime time charging since, for example, a request may be submitted during the day to be executed at night, or during the weekend.

In the monthly CAN report and in the output from the functions in the workspace 1 USAGE the task type of each session is identified by the form of the task identification number. This number is proceeded by one of the letters: T, N or B.

Both N-tasks and B-tasks are described in detail in the "SHARP APL Reference Manual" by Paul Berry and in the "SHARP APL Technical Notes", issues 4 and 5, obtainable through the Information Office (978-4990). In addition, there are a group of documentation variables in the workspace, 1 BTASKREQ which summarize several aspects of B-tasks.

Mary Ann Lawry

New WYLBUR Exec Allocates SAS Libraries

There is now a new WYLBUR exec for allocating a SAS data library. Since SAS requires its data libraries to be 'Direct Access (DSORG=DA)' the ALLOC and LIBALLO execs cannot be used. In all other ways, however, SASALLO is identical to its cousins, ALLOC and LIBALLO.

SASALLO will ask you for the dataset name, destination volume (users do not need to specify this), space required (in tracks), and DCB parameters (which should normally not be specified). In the sample session below, user input is in lower case and <cr> is the 'return' or 'enter' key.

```
? do sasallo<cr>
TYPE A '?' IN ANSWER TO A PROMPT
 FOR MORE INFORMATION
DATASET NAME? saslib<cr>
VOLUME? <cr>
ALLOCATION? 10,2 <cr>
DCB PARMS? <cr>
JOB 3160 W0000101 SUBMITTED
**CHECK THE OUTPUT FROM THIS
 JOB PRIOR TO REGISTRATION**
```

Once the job completes, indicated by a message on your terminal, you should 'fetch' the SASALLO submitted job and check the first step (the ALLOC step) to see if it ran successfully.

Remember to use 'do register' if you want to keep the dataset. If you don't it will be deleted by the system. Also, if you need a copy (or backup) of the SAS data library remember that standard system utilities such as IEBGENER cannot be used (they fail without ANY ERROR MESSAGE). Instead, allocate an empty SAS library using SASALLO, and then use PROC COPY within SAS to make the copy.

Alex Nishri

Data Security II: IBM Disk Backups and Restores

Online data requires protection from accidental loss caused either by the owner or by UTCS. Such loss could result from a user deleting the wrong files or from a UTCS system malfunction. Users are encouraged to maintain their own backups in order to protect valuable data. Limited protection is provided by the regular UTCS system backups.

In this article, the second in a series on data security, UTCS procedures for backing up diskpacks containing user datasets on the IBM academic system are described in detail. The policy and procedures for users to request a restore of a dataset are also described. This article concludes with some suggestions for managing data storage in a way that will maximize the protection of online data. Future articles in this series will assist users in maintaining their own backups and describe UTCS procedures on other systems.

Discussions in this article are limited to datasets stored on user volumes, namely USER01 through USER10. Normally, such a dataset will be registered and the dataset name will begin with a prefix of the form USER. , U01234. , or TS06789. , where 1234 and 6789 are user specific. Note, that this does not include APL or ATMS files. APL backups will be discussed in a future article. For UTCS maintained backups, users do not have to be concerned about how a dataset was created. Note, however, that if users create their own backups, different types of datasets require different methods.

At present, it is possible to create uncatalogued datasets. Usually this is done unintentionally and the primary effect is to increase storage costs to the unwary user. UTCS strongly discourages the use of uncatalogued datasets because of the added cost to the user in referencing, maintaining, and restoring these datasets. Such uncatalogued datasets are most easily detected on the monthly CAN accounting report. If the same dataset name appears more than once in the detailed listing, all but one with that name are definitely uncatalogued. For assistance in deleting uncatalogued datasets without losing the catalogued version, call Central Advising at 978-HELP.

Policy and Schedules for Backups

The primary purpose of UTCS backups is to protect against system failures. UTCS will assist a user to recover from accidental loss of online data. UTCS cannot, and does not, guarantee that such recovery will be successful. If loss is due to user error, then all costs associated with an attempted recovery are charged back to the user.

Backups of user volumes are essentially a snapshot of the volume at a particular moment in time. There are three cycles followed for backups: daily, weekly, and ‘monthly’. The ‘monthly’ cycle is actually every four weeks and does not always fall at the end of a calendar month.

Daily backups are done sometime between midnight and 5a.m. on each Tuesday, Wednesday, Thursday, and Friday. These tapes are retained for seven days before being reused. Weekly backups are done between 10 a.m. and 6 p.m. on each Saturday. They are retained for 31 days. The most recent weekly backup is placed in a vault early on Monday morning for extra security. The ‘monthly’ backup is done in place of the normal weekly backup every four weeks. These tapes are retained for one year (365 days).

Despite the number and frequency of system backups, there is some exposure for users’ data. A particular dataset must reside on the system at the time of a backup. Thus a dataset created on Tuesday and scratched on Friday will not appear on any

continued...

IBM Disk continued

weekly backup and can not be restored once seven days have passed. Note that the period between Saturday evening and Tuesday morning is the longest period between backups.

To permit users maximum access to the IBM academic system, backups are run while the system is available to users. If a user happens to write to a dataset at the same time as the backup is being done, that dataset may not be correctly copied to the backup tape. To avoid this possibility, a user can edit a copy of a dataset instead of the original during scheduled times for backups.

Requesting a dataset restore

To request that a disk dataset that was once stored on the IBM academic system be restored, call Central Advising at 978-HELP. Be prepared to answer the following questions. It may be possible to obtain some of information from other records if you are not prepared; however this can increase the time to actually restore the dataset by several days.

- When was the dataset stored on the system?
- When was the last time that the dataset was updated?
- What is the full name of the dataset?
- What volume was used to store the dataset?
- How many tracks were used to store the dataset?
- Was it a sequential dataset or a member of a partitioned dataset (Library)?
- Has space already been allocated in which to store the restored dataset?
- Do you already have a valuable dataset on the system with the same dataset name as the one you plan to restore?

The first four questions must be answered in order to identify which backup tape contains the dataset of interest. The next three questions are asked because it is necessary to allocate sufficient space before attempting to restore a file. The last question simply protects you from accidently destroying a current file in the process of restoring an earlier one.

If you wish to restore a member of a partitioned dataset, some care must be taken not to overwrite other members of the same library. The entire library will be restored from the backup tape, and members added or changed since the backup was made are lost. To avoid this potential loss, make a copy of the library, then request the restore, replace members which have changed since the backup, and finally delete the copy.

Almost all the historical information required is contained in the monthly CAN report for the period when the dataset existed. The detailed listing confirms that the dataset was on the system as well as providing its full dataset name, the user volume, and the number of tracks occupied. If the dataset of interest was catalogued and the time period is known, it is possible for a manual check of UTCS records to locate the user volume. However, this adds one or two days to the turnaround time for the restore.

As mentioned above, costs incurred in attempting to restore a dataset are charged to the user. The advisor will request a valid GPJS SAC and password in order to run the restore job. These jobs are normally run priority 8 so that the advisor can check immediately that the restore was successful. The cost to restore a dataset if the information provided is correct is approximately $13.00.

Managing data storage

The following hints are primarily common sense. Yet experience as a consultant and advisor indicates that some users do not take these simple precautions.

- Review the monthly CAN reports. If you are a SAC holder and someone else receives the CAN report, take the initiative and ask to see it. Look for evidence

continued...

IBM Disk continued

of uncatalogued datasets and arrange to delete them. Then retain the reports for at least a year in case a restore becomes necessary.
- If you create and scratch datasets frequently, create a hard copy listing of your datasets at midmonth. Batch users can use the utility DSMAP (see Userbook Section 3.4Utils). WYLBUR users need only sign on to a hard copy terminal and enter the 'DO LISTC' command to create such a listing. Contact Central Advising at 978-HELP for assistance using DSMAP.
- Leave datasets on the system long enough to appear on the weekly backup whenever possible. The added storage charges are simply insurance that if you do need to restore the dataset, it will be on a backup tape.
- If you edit datasets during a time when backups may be in progress, work with a copy of the dataset, so that the original will be properly backed up.

One last word of advice. If you have lost a dataset, contact Central Advising as soon as possible. This maximizes your chances of having the dataset successfully restored. At present, advisors are available between 10:00 and 18:00 from Monday to Friday.

Bill Fehlner
Terry Jones
Dave Wong

PACX Hints

Features not implemented

Due to problems in the Gandalf PACX, the following two features were **not** implemented on December 1, 1982:

1. Autobaud character passthrough
2. Single-scanning

These features may be implemented in the future when corrective action is taken by Gandalf.

Selecting terminal speed

With all the attention being given to the PACX (Private Automatic Computer eXchange) lately, many people have asked why there are different classes of access for the same machine. When you connect to one of our computers, first you go through the PACX. The PACX knows that the first character you type to it is a RETURN, and from this it decides what terminal speed you are at. Then it sends the 'enter class' message for you to respond. If, for example, you enter '10', the PACX connects you to the DEC-10 (PACX is like a small phone system, the DEC-10's number is 10).

Now that you are connected to the DEC-10, all should be well right? Not yet, for the DEC-10 doesn't know at what speed your terminal is talking. The hardware on the DEC-10 (or the IBM for that matter) isn't capable of figuring out your speed if it is higher than 1200 baud (this figuring out of speed is referred to as auto-bauding); therefore any terminal faster than 1200 baud has to come in on a line designated for that speed. (300, 1200, and 4800 are our standard connect speeds.) Fast terminals access the DEC-10 from class 12 which connects the user to one of these fast ports on the DEC-10. Other systems (PDP 11/70 for example) use what is known as 'break-baud' to select speed. These systems first send out the login message at 4800 baud. If you can read it, you then login, if not, you type BREAK and the system sends the login message out at 1200 baud. A second BREAK gets you 300 baud. Break-baud is easier for the system, but the user has to

continued...

PACX Hints continued

do some work.

Connecting to UTCS Systems

For complete information about connecting to UTCS systems via PACX, users are referred to a two page document, "PACX Signon Procedure", available at the Information Office, Engineering Annex, Rm 206. The document can also be sent to you via campus mail by phoning 978-4990.

Avoiding Accidental Disconnection

On some terminals, holding the BREAK key down, and on others, entering SHIFT and BREAK together, is interpreted by PACX as a request to disconnect. To avoid this, users should be careful not to hold the BREAK key down but to tap it instead.

Improving response

Leaving some terminals turned on when not in use causes a continuous request to PACX for service. (The terminals at the Engineering Annex are prime examples.) This increases the wait time for other users to obtain the 'enter class' prompt. Turning your terminal and modem off when not in use will greatly improve the response of our PACX system.

Terry Jones
Ron Vander Kraats

Small Systems News

Regular readers will be aware that UTCS has recently redeployed a number of staff members due to budget limitations. (See the article entitled "Welcome Back" in the September issue of *COMPUTERNEWS.)*

One result of this is that the former Communications and Small Systems group is now divided into two parts, one attached to the Facilities Management Group and one attached to the Communications and Field Service Group. We continue to share office space and other facilities in the Sandford Fleming building; only the reporting structure has changed. Some well-intentioned editing of last month's Small Systems News resulted in some misleading statements, so this month we offer the following corrections.

Communications Systems Planning and Development, Communications Software Planning and Development, and Field Service are part of the Communications and Field Service group, reporting to Norman Housley. The Small Systems Software Development and Hardware Development groups are now part of Facilities Management, reporting to Terry Wood.

The Microcomputing Facility is part of Communications, while the PDP-11 facility (formerly the CSS lab, and before that the CRF lab) is part of Facilities Management. Fortunately, we are all very good at communication (even those of us not in the Communications group) so we anticipate that UTCS staff in both groups will continue to operate smoothly together to serve our customers in the Small Systems area. The Small Systems News column will continue to be called Small Systems News, and to report on all aspects of the Small Systems activities.

Ian F. Darwin

Calling All Micros

Since the beginning of the fall term I have been collecting information about all types of microcomputers on the three U of T campuses. When this information is more complete, I will be able to bring together people with particular expertise and others that have questions regarding their machines.

One of the functions of the Microcomputer Facility is to maintain collections of public domain software for micro computers. Such software is available to faculty and staff free of charge. If we had information on the whereabouts of campus microcomputers, we would be able to contact people that could benefit from any of this software.

Accordingly I am asking that everyone who has a microcomputer on campus and is interested in being included in this database to call Grant Davis at 978-5071.

Grant Davis

BICS Update

The BICS facility was described in some detail in the October/November issue of *COMPUTERNEWS*. Major problems with hardware occurring at that time, especially with the SERIES/1's, have largely been resolved. Hardware and software development are continuing on BICS in order to improve the response of the system. It is hoped that problems of the magnitude experienced during the Fall term will not arise again.

UTCS staff have gained tremendous experience in the operations and maintenance of this new system. This experience provides a very solid base for the evolution of the BICS system.

BICS cannot yet be considered a mature system and our user community cannot be guaranteed the same response and accessibility as we offer for our other systems. Nevertheless, BICS has provided an adequate service for student use during the Fall term and shows promise of meeting the original goals set out for it.

In addition to sites at Robarts Library (68 terminals) and Sidney Smith Hall (50 terminals), 22 terminals have been added to the newest site at Victoria University. It is not expected that these additional terminals will degrade system response. Periods of poor response during the Fall term were attributed to hardware problems. Thus far it has not been possible to thoroughly benchmark the BICS system because of the number of interacting subsystems which are involved. For this reason, it is not yet known how many simultaneous student sessions the BICS system can support.

If any professors are interested in considering BICS for their courses, a demonstration account can be obtained by contacting Bob Keith at 978-5490. New courses can be added during this Spring term as long as storage space and terminal time is available. Bob Keith can provide the information required to add a course.

Bob Keith

Series/1

Users accessing full screen WYLBUR or TSO on the IBM Academic System at either the Engineering Annex or the Research Facility will encounter a slight delay during terminal connection through the Series/1. A new version of software was installed during December. It treats the first user response to the prompt 'Enter Terminal Type' as an error. Therefore, the user must enter 'terminal type' twice.

UTCS has contacted the suppliers who are also aware of the problem but are not planning to fix it in this release of the software. UTCS regrets this inconvenience but the problem will remain for some time to come.

If you encounter other apparent problems with the Series/1, please contact Charles Painter at 978-6945.

Charles Painter

Letter To The Editor

Dear Editor:

In answer to your evidently sincere request for reader feedback, "Yes, I like the new *COMPUTERNEWS* format". The December issue was well-organized, well-focused, and professionally done.

Keep up the good work!

Beverly Biderman
Programmer/Analyst
Student Record Services

Computing News in Brief

Some Helpful Advice

Enthusiasm for microcomputers is beginning to be felt at the University of Guelph and in many other places. Because this technology is relatively new, people are unsure of where to start in evaluating small systems. Peter Taylor, Office for Educational Practice at the University of Guelph has provided some useful advice before purchasing a microcomputer. This advice is geared for those in a university environment but applies to other environments as well. It consists of a search strategy which is broken into three phases. Each phase involves some questions which should be asked before and during the search for a microcomputer.

Define your needs:

- Do you need word processing? statistics? filing? accounting packages?
- What do you want in your records?
- Do you need alphabetical or numerical or both?
- How are you going to sort and index your work?
- Do you need a printer or only a screen?
- How large a data bank will be created and who will use it?
- How often will the machine be used?
- Are tape cassettes, floppy disks, or hard disks needed?
- What type of backup system will you get? (A copy of your work is needed for insurance.)

continued...

Computing News in Brief continued

- Do you want to dial-in to the PACX network?
- For test purposes, make up some sample records and use them in your search.

Find the best software first:

- Look in magazines, books; talk to sales reps.
- Compare your needs and those systems created by 3-5 major suppliers.
- Talk to users; borrow manuals.
- Look at flexibility, data security, ease of operation, cost.
- Arrange WORKING demos; try your test records.
- Narrow your focus to one or two software packages.
- Are they able to perform multiple functions for you?

Match the Software to the Best Hardware:

- Compare overall design, cost, maintenance, size.
- Consider the location: lighting, access/security, connection to PACX network.
- Write down your comparisons and then decide.
- Find the best supplier.
- Drive a hard bargain (free disks, paper, ribbon, etc.)
- Follow up with regular maintenance, questions about upgrading software and/or hardware.

(Material for this article has been adapted from the University of Guelph newsletter, *NEWS FROM ICS,* November/December 1982, Vol. 4, No. 11.)

A Handy Word Processor

Microwriter Limited of London, England has developed a personal, hand-held word processor called a Microwriter. This machine measures 230 x 117 x 50mm, weighs 735 gm, and is battery operated, giving 30 hours of use.

The Microwriter has a five finger keyboard enabling the user to write the entire alphabet and numerics. The keys, which relate to the shape of the letters in the alphabet, are pressed simultaneously. By using different combinations, letters and numbers are formed. A sixth key, called the control key, can perform insertion, deletion, correcting, tabbing, and backwards and forwards read. The system is supposed to be faster than handwriting and can be learned in one hour.

The Microwriter has a built in display panel or can be connected to an ordinary television. It is also capable of producing printed copy by plugging it into a daisy wheel printer or electronic typewriter. It has a memory of 8K bytes. Text can be stored on a mini cassette or floppy disk by using a micro-computer or word processing system.

This handy machine is already in use in the United Kingdom by over 2,000 users. It was to be introduced in North America in 1982, so you may already be using one.

(Material for this article has been adapted from *EDP World,* August 1982, page 23.)

A Look at the Future

In October 1982, Ontario launched a $120-million technology development program. This event, held at Carleton University, also marked the opening of the $20 million Ontario Centre for Microelectronics. A report prepared by the engineering departments of Carleton and Ottawa universities gives us a look into the future of technological development. The report points to some standard features of computers that should appear by the year 2000.

Computers in the home will be able to understand human speech thus appearing human. They will be able to recognize and respond to the human voice. Attitudes such as sympathy and affection are to be included in their personalities. The use of data from centralized libraries and data-

continued...

Computing News in Brief continued

banks will enable people to work at home.

Things, such as machinery, will be able to self-diagnose. Therefore, if you miss a checkup on your car, it will complain. Food will be artificially produced. Breakfast cereals will begin as pieces of wood. The use of robots for general purpose duties will be in the early working stage. Communication through the use of high speed fibre-optic channels will enable the exchange of graphs, pictures and documents. In addition, holographic communication will produce life-like three dimensional images. Moving holographs will bring a new era in home and theatre entertainment by the year 2015.

Do you think you will be prepared to love your computer, listen to your car complain, and eat cereal made from wood?

(This material was adapted from *Ontario Technology News,* December 1982.)

Kathryn Bourne

Change Committee

Users wishing to suggest changes should contact their Marketing Representative or Dr. Frank Spitzer, Manager of Consulting. Users should contact the Advising office at 978-HELP if they encounter problems related to these changes.

1. Old SYSOUT classes 6 and 7 for the GOULD were removed on November 29. Users should use the new form names.
2. UTCS will be installing Release 9 of MARK IV on the Academic System.
3. IMSL Version 9 will be installed on the Academic system in the future.
4. UTCS plans to install the 1982 version of BMDP on the Academic system.
5. IPRINT on the DEC-10 has been upgraded. This is now in SYS:.
6. UTCS added a new spool pack for the Academic system on December 8.
7. ORACLE (on-line help for error messages in PL/C and WATFIV) is now available at EAT, ASUT, Robarts and Victoria University (U of T).
8. A new BICS site is now available at Victoria University (U of T).
9. SASALLO EXEC is now available to create SAS libraries and direct access datasets using WYLBUR.
10. A 3279 colour terminal was installed on December 8, (for graphics use) in the Education Facility, located in McLennan Labs, Room 221.
11. UTCS will be upgrading UNIX on the PDP 11/70 from Version 6.
12. UTCS plans to provide CALCOMP support for the DEC-10 in the new year.
13. UTCS will be installing research terminals at the Department of Zoology.
14. Default forms for HELP and on-line documentation has been changed to 2230. This is to avoid the special forms charging.
15. UTCS plans to charge real money for 9700 output and punched cards.
16. VMS on the SCS, Erindale, and Scarborough VAX's will be upgraded to Version 3.1.
17. MVS/SP Version 1.3.1 will be installed on the Academic system in the new year.
18. VM/SP Release 2 will be installed on the 3033U16.
19. UTCS plans to introduce CMS service on the 3033U16 in the future, for research purposes only.

Cecilia Welch

Summary of APL Hotnews Items

The following is a list of HOTNEWS items entered between November 13, 1982 and December 31, 1982.

DATE	TITLE
22/11/82	New version of PACX going in on December 1, 1982.
23/11/82	APL B-tasks will be installed on November 29, 1982.
26/11/82	The CIPS APL SIG is meeting on Wednesday December 1, 1982.
29/11/82	APL Batch tasks are now available, using ws 1 BTASKREQ.
07/12/82	Unattended operation in effect over the Christmas Holidays.
22/12/82	UTCS answering service over the Christmas holidays.
23/12/82	Punched card output will be charged.
24/12/82	Class A region size temporarily increased.

APL HOTNEWS may be accessed by loading the workspace, 1 HOTNEWS. For example, to print the news of November 28, 1982, type: NEWS '28/11/82'. To print all news items since October 1, 1982, type: NEWS SINCE '01/10/82'. For more instructions on the use of this workspace, please see the variable DESCRIBE.

Mary Ann Lawry

The Advising Corner

The following is a list of interesting problems that have been encountered through the Central advising office. It is believed that sharing these on regular basis in *COMPUTERNEWS* will enhance our services to our user community.

SPSS: DD statements

Those who are outputting a raw data file with FT09F001 DD statetment, (for example, outputting residuals with NEW REGRESSION) should be aware of the correct placement of this statement in their JCL setup. In order to override the default DD statements (this includes FT09F001 and others) that are provided at our installation, the user must place these DD statements immediately after the // EXEC SPSS statement. The following example will illustrate this:

```
//  EXEC SPSS
//FT09F001  DD  DSN=raw data file name,
//  DISP=OLD
//INFILE  DD  DSN=spss system file name,
//  DISP=SHR
//SYSIN  DD  *
   .
   spss program
   .
/*
```

SPSS:SORT Cases

Some of the information printed out when SORT CASES is used is incorrect. At the end of the SPSS job when sorting cases, it is indicated that SORT read 0 records and also outputted 0 records. This is misleading for those who are concerned about their output since in reality the SORT was performed.

SAS: DO loops

We know that SAS is a very powerful and flexible package. But, this flexibility can

continued...

Advising continued

get a user into trouble very easily. One tricky and very costly problem is created in a DATA step by an infinite DO loop. The following example illustrates this:

```
DATA TEMP;
   INPUT X Y Z @;
     IF X NE 0 THEN DO UNTIL(X=W);
         INPUT V W @;
     END;
CARDS;
1 34 56 67 .
   .
   . data cards
  other SAS statements
   .
```

Because of the @ holding of the input line, at the first occurrence where W is not equal to X the same line will be read over and over until you run out of time, a very costly proposition.

XT100: Arrow Key Errors

The four arrow keys on Lanpar XT100's are not recognised by the IBM when accessing via classes 30 (IBMA) or 32 (IBMAF). Their use will result in strange characters being inserted in your data that don't show up on the screen, but cause unpredictable execution results. To correct errors on the line you are typing use the back space key or ^H (Control H) to back up to the place where the error was made, then retype the rest of the line over. To correct a file that has been damaged by the use of these arrow keys, you can use a global substitution to change the escape character to something easily detected. For example, if you change the escape character to #, you can then look at all occurrences of the # in your file. (The escape character is a non-printable character. The # is printable.) Then you can delete the # and any incorrect offending characters around it. (The arrow keys actually send the escape character and a few others, so you have to remove all unwanted characters.) For example, WYLBUR users would use the commands:

```
CHANGE '$' TO # IN 1/L
LIST #
```

where $ is the escape (ESC) key. Note that the change command entered as shown above may not appear in its entirety on the screen because of the effect of the escape character.

If you require more information, or if you have a particular problem requiring a solution, contact Central Advising at 978-HELP.

William Barek
Terry Jones

DEC-10 Gripes

Submit IBM:
Could it be arranged that when a SUBMIT IBM:=file1,file2,... reports that one of the files does not exist, it aborts submitting anything to the IBM? A job with one file missing is almost surely useless!

Answer
Unfortunately this is a piece of DEC-10 software which we will not be changing. However, we have written a smart MIC file called IBMSUB. Use it by typing:

```
DO IBMSUB file1,file2,file3,...
```

Switches are not allowed with IBMSUB. However, if switches are needed then do the following:

```
COPY  t.sub=file1,file2,...
SUB   IBM:=t.sub/...switches
```

COPY will test to see if the files exist and will give you an error message if they do not. Then just delete whatever temporary

continued...

Gripes continued

file you created (in this case t.sub) after the submission is successful.

Job Capacity
There appears to be a problem with the machine's capacity. It is supposed to support 75 users, but though at present there are only 55 logged in, login is greeted with a message 'job capacity exceeded'. Can we be reassured that the problem is being looked into?

Answer
We understand your obvious concern in this matter. However, you may rest assured that there is no problem. The message 'Job Capacity Exceeded' is precise in its meaning. This means that the number of jobs (or tasks) being handled by the System, at the time, has reached its maximum level. This necessarily takes into account various operator jobs that are essential for the proper operation of the DEC-10, as well as any detached jobs and jobs currently in the process of logging in. To paraphrase, the limit 75 refers to the number of jobs being handled by the system, as opposed to the number of users logged in.

APL Path Structure
Can you tell me in what PPN the APLSF public library resides? I need to find a file associated with LIB4:DOCWS that used to be in [5,31] but which appears to have moved. Thanks.

Answer
You appear to not have DSKB: on your search list. There are two ways around this. 1) Use DO ADDB to put DSKB: on your searchlist throughout the current job; 2) or refer to it specifically by placing DSKB: (or the pseudo structure APL:) in front of each file reference.

1200 Baud Modems
When dialing 978-3959 I often get the carrier, i.e. the beep. However, when I attempt to connect, the line goes down repeatedly. After many attempts, I finally do get a connection, i.e. the 'enter class' message. Your operators are no help. Some don't even know that 3959 is a good number for 1200 baud operation (and this was advertised in *COMPUTERNEWS)*. This is frustrating, time-consuming, and costly. Please don't tell me its my fault--I have been using this system, this way, for months.

Answer
We had some hardware problems that are now fixed (we hope). However, if there are any further problems please Gripe them along with the time, day, and number you were trying to use.

Terry Jones

User Exchange

Sale at Scarborough

The Scarborough College Computer Centre is currently offering the following items for sale:

4 TAB 410 keypunch/verifiers

3 Keypunch Card Cabinets -

one 20-drawer (2 wide, 10 high)
one 15-drawer (3 wide, 5 high)
one 10-drawer (2 wide, 5 high)
(each drawer holds approximately 4000 cards)

If you are interested in any of the above items, contact Bob Blackburn at 284-3173 for more details.

Small Computer Systems for Sale

The Facilities Management group at UTCS has a number of small computer systems for sale. Suitable application areas for these desk-top computers are data collection, data analysis, control of experiments, or general computing.

Each system consists of a terminal and a disk subsystem. The terminal contains an LSI 11/23 processor, 192 Kbyte memory, disk controller, and a serial interface which allows connection of three additional devices such as a printer, a graphics tablet, a plotter, or another display terminal. The disk subsystem, housed in a separate enclosure, includes an 8-inch floppy disk drive with a storage capacity of one Megabyte per diskette, and a 7.5 Mbyte Winchester disk which is sealed and non-removable.

Installation and warranty are included in the purchase price. Our Software Development group can assist you in selecting the appropriate software to meet your requirements while the Field Service group can provide maintenance either under a monthly contract or on a per call basis. The Hardware Development group can also reconfigure this system to suit your specific application requirements. For more information, contact Luke Sulatycki at 978-4693.

Personnel Changes

The following personnel changes have occurred since November 1982: **Michael Wagner** has been promoted to IBM VM Supervisor. **Peter Wall** has been promoted from Programmer 3 to Programmer 4. **William Barek** and **Terry Jones** are now the Computing Services Consultants within the Advising Group. **Bruce Pinn** who has been working for UTCS part-time will now be working as a full time Networking Programmer.

Mike Hart the User Consultant at the Arts and Sciences terminal has left, and **Ken Rentner** a Waterloo co-op student, has arrived. Welcome Ken!

Patricia Shore the co-op student in Publications has left to return to Waterloo for another school term. Her enthusiasm, professionalism, and artistic abilities will be remembered by all of us here in Publications. Good Luck Pat! At this time I would like to welcome **Carol Wehrle** our new co-op student from Waterloo. She will be helping out in Publications and the Information Office for the next four months.

Elizabeth Weitmann

Recent Acquisitions in the Computer Library

ACM SIGACT-SIGOPS Symposium on
Principles of Distributed Computing,
Ottawa, Aug. 1982.
Proceedings.
New York, ACM, 1982.

ACM Symposium on Theory of Computing.
Conference record. No. 14 (1982).

Aho, Alfred V., Hopcroft, J.E. and Ullman, J.D.
Data structures and algorithms.
Reading, Mass., Addison-Wesley, 1983.

Annual review of information science and
technology.
v.17 (1982).

APL 81 Conference, San Francisco, Oct. 1981.
Proceedings, ed. by W.L. Anderson and
D.G. Smith.
New York, ACM, 1981.

Brady, Michael, ed.
Computer vision.
Amsterdam, North-Holland, 1981.

Bray, Olin H.
Distributed database management systems.
Lexington, Mass., D.C. Health, 1982.

Clinic on Library Applications of Data
Processing, University of Illinois.
Proceedings.
1980.

Dijkstra, Edsger W.
A discipline of programming.
Englewood Cliffs, N.J., Prentice-Hall, 1976.

Handbook of artificial intelligence.
Stanford, Cal., Heuristech Press, 1981-82.
3 v.
v.1,2 ed. by A. Barr and E.A. Feigenbaum.
v.3 ed. by P.R. Cohen and E.A. Feigenbaum.

Hogan, Thom.
Discover FORTH: learning and programming the
FORTH language.
Berkeley, Cal., Osborne/McGraw-Hill, 1982.

IFIP TC-6 International Workshop on Integrated
Office Systems - Burotics,
Versailles, France, Nov. 1979.
Integrated office systems - burotics, ed. by
N. Naffah.

International Symposium on Multiple-Valued
Logic, Toronto, May 1973.
Conference record.

Salton, Gerard. and McGill, M.J.
Introduction to modern information retrieval.
New York, McGraw-Hill, 1983.

Sunshine, Carl A., ed.
Communication protocol modeling.
Dedham, Mass., Artech House, 1981.

Winograd, Terry.
Language as a cognitive process, v.1: syntax.
Reading, Mass., Addision-Wesley, 1983.

Stephanie Johnston

UTCS Terminal and Advising Sites

Names and Locations

- **Central Advising Office (CAO), 978-HELP,** McLennan Labs, 60 St. George St., Room 257
- **Education Facility (Educ),** McLennan Labs, 60 St. George St., Room 221
- **Engineering Annex (EAT, EUT, CDF),** 11 King's College Road, Rooms 103, 104, 107, 201, 203.
- **Erindale College (Erin), 828-5339,** Mississauga Road, Erindale Campus, Rooms 2005, 2039, 2045
- **New Physics (NPT),** Burton Tower, 60 St. George St., Room 1202
- **Robarts,** Robarts Library, 130 St. George St., Room 1061A
- **Scarborough College (Scar), 284-3122,** Military Trail, Scarborough Campus, Room S624
- **Sidney Smith (AST & ASUT),** 100 St. George St., Rooms 1071, 1073, 2105
- **Zoology (ZUT & ZAT),** Ramsey Wright Bldg, 25 Harbord St., Room 107
- **Victoria University (Vict),** 73 Queens Park Cres., Room 012.

	Hours of Operation				**Restrictions***	**Advising**
	Mon-Thurs	Fri	Sat	Sun		
AST	24 hrs/day	24 hrs	24 hrs	24 hrs	Research	Rm 2100
ASUT	24 hrs/day	24 hrs	24 hrs	24 hrs	BICS	No
CAO	10-6	10-6				Rm 257
CDF	24 hrs/day	24 hrs	24 hrs	24 hrs		No
EAT	24 hrs/day	24 hrs	24 hrs	24 hrs		Rm 106
Educ	9-5	9-5			Research	CAO
(outer)	9-11	9-5			Research	CAO
Erin (2039)	9-9:30	9-4:30	12-5:30	12-5:30	Research	Rm 2005
(2045)	9-9:30	9-4:30	12-5:30	12-5:30	Undergrads	Rm 2005
EUT	24 hrs/day	24 hrs	24 hrs	24 hrs	Undergrads	No
NPT	24 hrs/day	24 hrs	24 hrs	24 hrs	Research (Key access)	CAO
Robarts	8:30-12	8:30-12	9-5	1-10	BICS	No
Scar	9-12	9-12	10-5		UNIX on CDF	Rm 627, 628A
ZAT	9-9	9-5			Research	No
ZUT	9-9	9-5			Undergrads	No
Vict	7-11	7-11			BICS	

* NOTE: Research includes graduates, faculty, staff.

Advising Hours

CAO, AST/ASUT	Monday to Friday, 10 a.m.-6 p.m.
EAT	Monday to Friday, 1 p.m.-5 p.m.
Erin, Scar	During normal hours

Services Available

	BICS	**Keypunch**	**LIBRA**	**PACX**	**Printers**	**Oracle**	**UNIX**
AST		Y		Y	Y		
ASUT	Y				Y	Y	
CDF					Y		Y
EAT		Y	Y	Y	Y		
EUT		Y			Y	Y	
Educ				Y	Y		
Erin			Y	Y	Y		Y
NPT		Y		Y	Y		
Robarts	Y				Y	Y	
Scar		Y	Y	Y	Y		Y
Vict	Y				Y	Y	
ZAT		Y			Y		
ZUT		Y			Y		

UTCS Systems

3033/N12 Processor

- located in McLennan Physical Laboratories
- provides General Purpose Job Stream, High Speed Job Stream, TSO, WYLBUR, APL and ATMS services
- 12 megabytes of memory
- MVS with JES2

3033/U16 Processor

- located in McLennan Physical Laboratories
- provides "Glass Keypunch" access to HSJS using BICS
- 16 megabytes of memory
- UTS under VM

4341 Mod II Processor

- located in McLennan Physical Laboratories
- provides administrative IMS/VS, DB/DC, Batch and TSO
- 8 megabytes of memory
- MVS with JES2

DECsystem-10 Model 1090

- located in McLennan Physical Laboratories
- provides General Purpose Time-Sharing
- 512 K - 36 bit words of memory
- TOPS-10 operating system, version 7.01

Communications & Field Services (CFS)

- located in Sandford Fleming Building, Fourth Floor
- DEC PDP-11/40 with GT44 Graphics
- DEC PDP-11/05 with GT40 Graphics
- Various Z80-based microcomputers (S-100, CP/M)
- IBM Personal Computer
- Western Digital Pascal MicroEngine
- Apple II Plus
- Radio Shack TRS-80
- provides specialized interactive graphics
- provides online and real-time computing services, data acquisition and conversion, and minicomputer services
- provides communications consulting and installation
- maintains computer systems
- provides consulting and configuration of microcomputer systems

PDP 11/70

- located in McLennan Physical Laboratories
- provides UNIX text processing
- 640K of memory
- UNIX (Western Electric)

VAX 11/750

- located in Engineering Annex
- provides Computer Science interactive access
- 2 megabytes of memory
- UNIX (Berkeley)

VAX 11/780

- located in Engineering Annex
- provides Computer Science interactive access
- 4 megabytes of memory
- UNIX (Berkeley)

VAX 11/780

- located in McLennan Physical Laboratories
- provides backup, program testing, and inter-communication relating to student services
- provides Spare Cycle Service
- 4 megabytes of memory
- VMS

VAX 11/750

- located at Scarborough College
- provides "Glass Keypunch" access to HSJS using LIBRA
- 2 megabytes of memory
- VMS

VAX 11/780

- located at Erindale College
- provides "Glass Keypunch" access to HSJS using LIBRA and Research access
- 4 megabytes of memory
- VMS

Consulting and Enquiries

Internal Users Marketing	Dr. Bill Fehlner	MP217	6509
External Users Marketing	Ihor Prociuk	MP217	6875
Erindale College	Peter Wall	2043	828-5311
Scarborough College	Bob Blackburn	S628-A	284-3173

General Enquiries	4990	System Status Enquiries (DEC)	4318
Programming Advising	HELP	System Status Enquiries (IBM)	7393
Access Codes	8703	300 Baud Interactive Services	6200
Account Enquiries (U of T)	8702	1200 Baud Interactive Services	3959
Account Enquiries (External)	7148	DATAPAC	4320 0056
Tape Library (Academic Services)	7319	Telenet	20477
Tape Library (Administrative Services)	6693	Tymnet	<backspace> DPAC;302043200056
U of T Computer Library	2987		

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